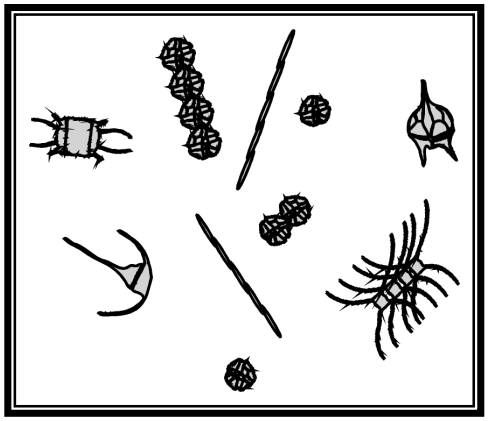
CALIFORNIA DEPARTMENT OF HEALTH SERVICES
2151 Berkeley Way, Room 118, Berkeley, CA 94704

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring and Control Program

BIOTOXIN MONTHLY REPORT

May 1999



PHYTOPLANKTON MONITORING: *Pseudo-nitzschia* Bloom Continues in Southern California

The enclosed report (No. 99-13) shows the distribution of toxigenic phytoplankton during May. The *Pseudo-nitzschia* bloom that persisted along the Southern California coast over the past two months declined by the beginning of May for most sites. The bloom continued along the coast of San Diego, however, and our volunteer observers in that area continued to report high densities of this diatom throughout most of May.

Our program volunteers along the coast of Orange and Los Angeles counties began picking up high densities of *Pseudo-nitzschia* by the second week in May. Within a week this diatom was also abundant along the Santa Barbara coast.

Because of the extensive nature of this latest bloom, many of our volunteers contributed extra time and effort to collect additional samples. Thanks to their enthusiasm and dedication we were able to track this bloom along a tremendous expanse of coastline, something that would be impossible for any single agency to accomplish! A quick look at Table 2 will give you an appreciation for the diversity and efforts of these wonderful folks.

SHELLFISH MONITORING: Domoic Acid Declines

The detection of a resurgent bloom of *Pseudo-nitzschia* prompted our program to look for domoic acid in the shellfish samples collected from the affected areas. The state's Food and Drug Laboratory reported that there was no detectable toxin present, indicating that the species of *Pseudo-nitzschia* that was abundant was not a toxin-producer.

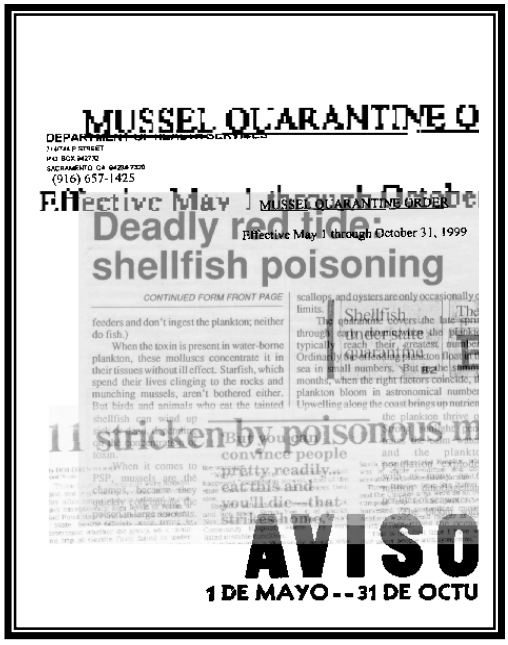
PSP toxicity was also absent in May, a very rare occurrence for this time of year.

How to Contact Us:

The Biotoxin Monthly Report is prepared and distributed by the California Department of Health Services' Marine Biotoxin Monitoring and Control Program.

For information on our program please call (510) 540-3423, fax us at (510) 540-2716, or send me an email at glangloi@ix.netcom.com.

Call our toll-free number for recorded information on shellfish quarantines related to marine biotoxins: (800) 553-4133.



Quarantines

The annual quarantine on sport-harvested mussels occurs each year from May 1 through midnight on October 31. This quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries.

Our program continues monitoring for marine biotoxins, and the toxin-producing phytoplankton that produce them, throughout this quarantine period. If dangerous levels of toxins are found in mussels, we may expand our monitoring to include other types of bivalve shellfish like clams and scallops. If any of these species are found to contain toxin levels of concern we will implement a species quarantine on the affected species within the area. Of course if the levels

(Continued on page 2)

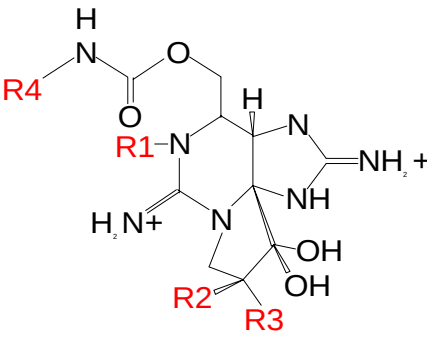
of toxin in mussels are really high we will immediately impose a special quarantine for the affected areas and species without waiting for additional samples.

Sport versus Commercial Shellfish

We are frequently asked why, if there is an annual quarantine on sport-harvesting of mussels, you can still buy mussels in the market. Because our program also regulates the commercial shellfish growing areas in California, we can require each grower to submit samples at least weekly for toxin testing. As a result we can ensure that the first occurrence of toxicity is detected before the alert level is reached. Frequent sampling and oversight allow the shellfish growers to stay in business and ensures that any product in the market does not contain dangerous levels of marine biotoxins.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. This particular species is known to concentrate and retain the PSP toxins for a long period of time. By discarding the dark part of the siphon and the viscera the consumer can reduce the risk of ingesting these toxins. Persons taking any clams or scallops are advised to remove and discard the dark parts (i.e., the digestive organs or viscera), which are more likely to contain toxins than the white tissue.

We also advise that persons engaged in the sport-harvesting of any bivalve shellfish should contact our "Shellfish Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity.



Paralytic Shellfish Poisoning

(The following information was excepted from the publication entitled "*California's Paralytic Shellfish Poisoning Prevention Program, 1927 – 89*" by Douglas Price, Ph.D., and Kenneth Kizer, M.D., M.P.H.)

Background

Paralytic Shellfish Poisoning (PSP) is an acute, sometimes fatal form of food poisoning that has been a public concern in California for many decades. The syndrome is caused by eating mussels, clams, oysters, and other filter-feeding marine bivalve molluscs that have become poisonous from ingesting certain marine dinoflagellates that contain saxitoxin and related biotoxins. The dinoflagellate of concern along California's coast is *Alexandrium catenella*, formerly known as *Protogonyaulax catenella* and *Gonyaulax catenella*.

Toxins

Saxitoxin and the related compounds causing PSP are among the most potent poisons known. The oral LD_{50} of saxitoxin for mice is about 263 ug/kg. A fatal oral dose for humans is only a few milligrams. Saxitoxin blocks the sodium channel of nerve membranes and thereby inhibits neuronal transmissions.

Health Effects

Symptoms of PSP usually begin within 15 to 90 minutes after ingesting toxic shellfish and most often consist of parasthesia and numbness of the tongue, lips, and fingertips. If the dose is sufficient, this may be followed by muscular incoordination and, in advanced cases, ascending paralysis. Death may result from diaphragmatic paralysis and respiratory failure within 2 to 12 hours.

The type and severity of symptoms depend upon the concentrations o of the toxin in the shellfish and the amount of shellfish consumed. Available data ***do not*** support the belief that persons who commonly eat shellfish in affected areas may develop resistance to the toxin.

Although the literature offers a range of opinions regarding the clinical implications of ingesting various levels of PSP toxins, and while there seem to be wide differences in human susceptibility to these toxins, it is reasonable to extrapolate that ingestion of 200 to 500 ug is likely to cause at least mild symptoms; ingestion of 500 to 2000 ug is likely to cause moderate to severe symptoms; and consumption of more than 2000 ug is likely to produce serious, and possibly lethal, consequences.

Note: Limited copies of the cited report are available by contacting our program. This valuable summary report of PSP in California was also published as:

Price, D.W.; K.W.Kizer; and K.H.Hansgen. 1991. California's Paralytic Shellfish Poisoning Prevention Program, 1927 – 89, Journal of Shellfish Research, 10(1): 119-145.

Gregg Langlois

Table 1. California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during May 1999.

COUNTY	AGENCY	SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	4
	Humboldt County Environmental Health Department	1
Mendocino	CDHS Volunteer	3
Sonoma	Bodega Marine Lab	1
	Environmental Management Branch	1
Marin	Bay Bottom Beds, Inc.	4
	Cove Mussel Company	3
	California State University Monterey Bay	4
	CDHS Environmental Management Branch	3
	Hog Island Oyster Company	3
	Johnson Oyster Company	16
San Francisco	San Francisco County Health Department	2
San Mateo	San Mateo County Environmental Health Department	2
	California State University Monterey Bay	2
Santa Cruz	Santa Cruz County Environmental Health Department	1
Monterey	California State University Monterey Bay	4
	Monterey County Environmental Health Department	1
San Luis Obispo	Williams Shellfish Company	4
	San Luis Obispo County Environmental Health Department	2
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
	Vandenberg Air Force Base, Environmental Health Services	1
	California Department of Parks and Recreation	1
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	6
	Southern California Marine Institute, Fish Harbor Lab	1
Orange	Orange County Health Care Agency	1
	Ecomar, Inc.	5
San Diego	CDHS Volunteer	2
	Carlsbad Aquafarms, Inc.	3

Table 2. Agencies and organizations participating in marine phytoplankton sample collection in California during May 1999.

COUNTY	AGENCY	SAMPLES
Del Norte	Crescent Coastal Research	1
Humboldt	Coast Seafood Company	4
	Humboldt State University Marine Lab	1
Mendocino	California Department of Parks and Recreation	1
	CDHS Volunteer (Sara Wheaton, John Richardson)	6
Sonoma	None Submitted	
Marin	CDHS Volunteer (Brent Anderson)	1
	CDHS Environmental Management Branch	3
	Johnson Oyster Company	14
Alameda	City of Berkeley	1
San Francisco	CDHS Volunteer (Eugenia McNaughton)	4
	Point Reyes Bird Observatory	1
San Mateo	None Submitted	
Santa Cruz	O'Neill Yacht Charters	1
	Santa Cruz County Environmental Health Department	2
Monterey	CDHS Volunteer (Lisa Marrack)	1
	U.C. Reserve System	1
San Luis Obispo	Morro Bay 4-H	1
	Tenara Environmental	2
Santa Barbara	California Department of Parks and Recreation	1
	Vandenberg Air Force Base, Environmental Health Services	1
	U.C. Santa Barbara Marine Sciences	3
Ventura	California Department of Parks and Recreation	2
Los Angeles	Southern California Marine Institute, Fish Harbor Lab	3
	Los Angeles County Sanitation District	1
	Los Angeles County Health Department	3
Orange	Orange County Marine Institute	1
	Orange County Sanitation District	2
San Diego	CDHS Volunteers (Paul Sims, Randy and Bill Dick, Kai Schumann, Jeff Kermode, Vicki Ganguli, and Rachel Woodfield)	18
	San Digeo County Environmental Health	8

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ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring and Control Program

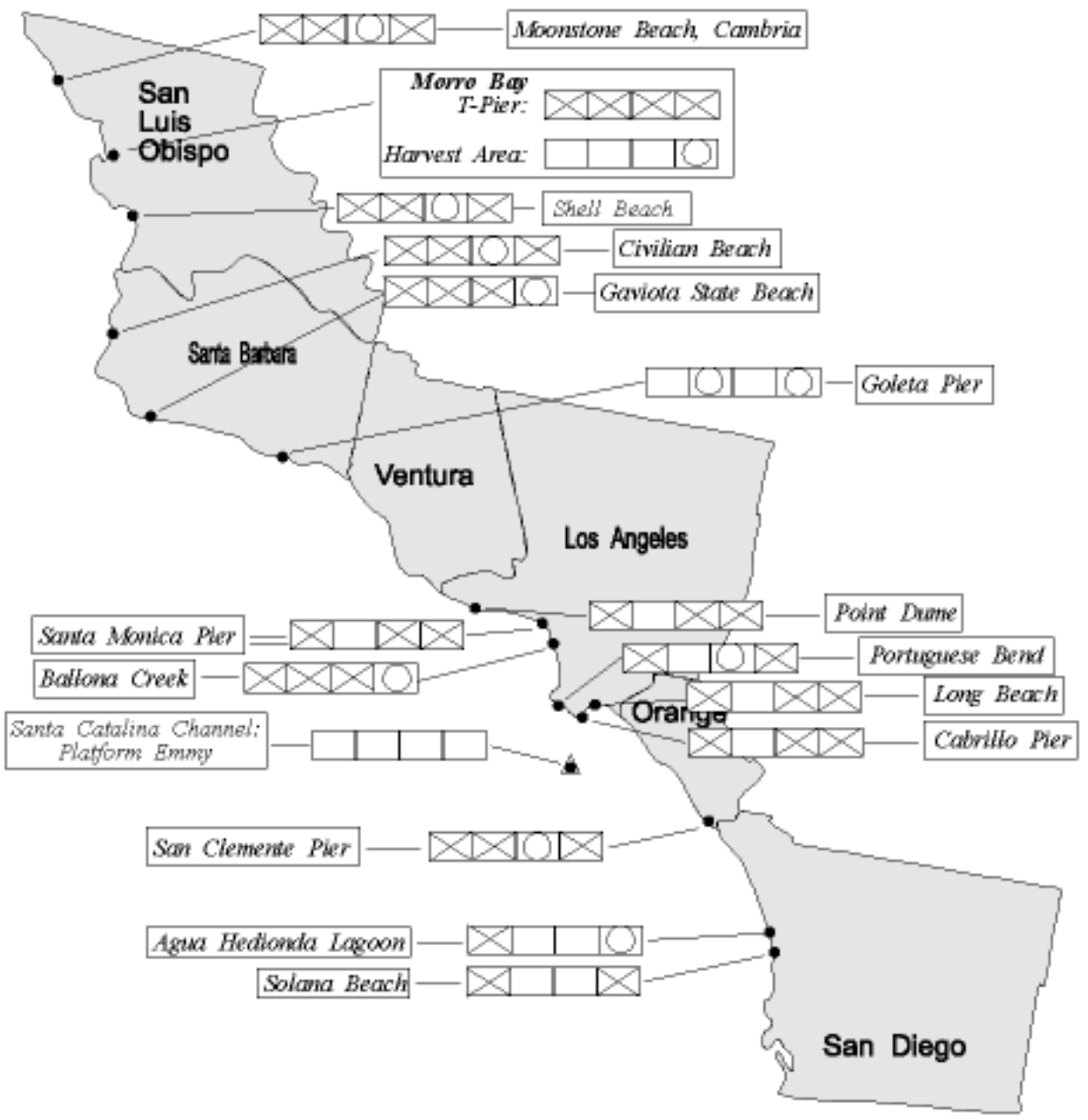
SHELLFISH BIOTOXIN MONTHLY REPORT

May 1999

Technical Report No. 99-12

Distribution of Shellfish Biotoxins

Southern California



KEY FOR SHELLFISH BIOTOXIN DATA

Week:	1	2	3	4
PSP Range: (ug/100 g)	no sample	not detected	< 80[1]	≥80
DA Range: (ppm)	no sample	not detected	< 20[2]	≥20

[1]PSP Alert Level [2]DA Alert Level
● = Single Site ◉ = Multiple Sites ▲ = Offshore Site

Source: DHS Marine Biotoxin Monitoring and Control Program, May 1999.

INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

Southern California Summary:

Paralytic Shellfish Poisoning (PSP): PSP toxicity was not detected at any sampling stations during May.

Domoic Acid (DA):

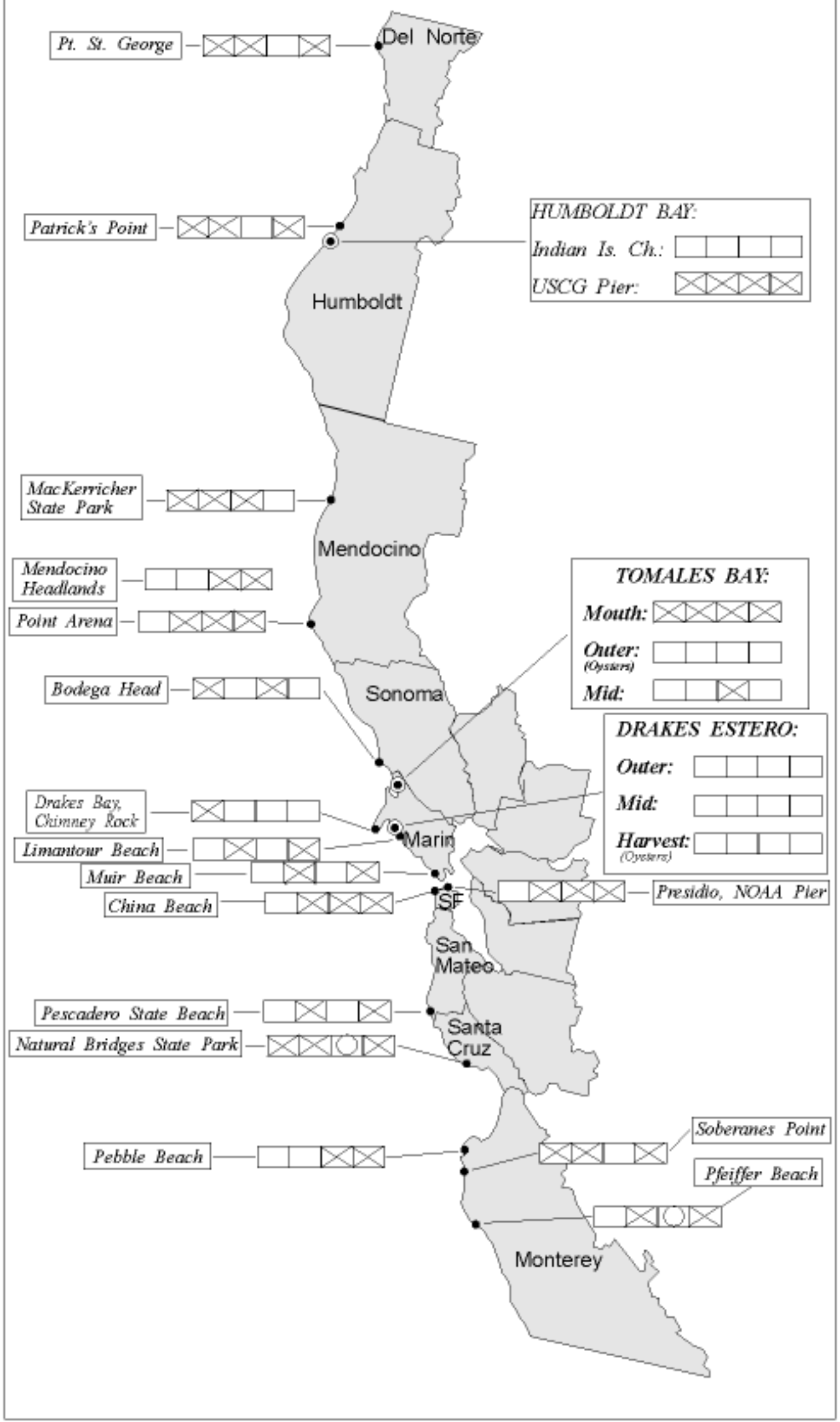
A bloom of *Pseudo-nitzschia* at several southern California locations (see Technical Report No. 99-13) prompted the analysis of shellfish samples for DA. The state's Food and Drug Laboratory reported that there was no detectable DA in any shellfish samples collected during May.

For Information on our Volunteer Field Sampling Program Please Call:

(510) 540-3423

Distribution of Shellfish Biotoxins

Northern California



Northern California Summary:

Paralytic Shellfish Poisoning (PSP):

PSP toxicity was not detected in any shellfish samples collected from Northern California counties during May.

Domoic Acid (DA):

Domoic acid was not detected in any shellfish samples collected from Northern California counties during May.

The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.

For More Information Please Call:
(510) 540 - 3423

For Recorded Biotoxin Information Call:
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ENVIRONMENTAL MANAGEMENT BRANCH
Phytoplankton Monitoring Program

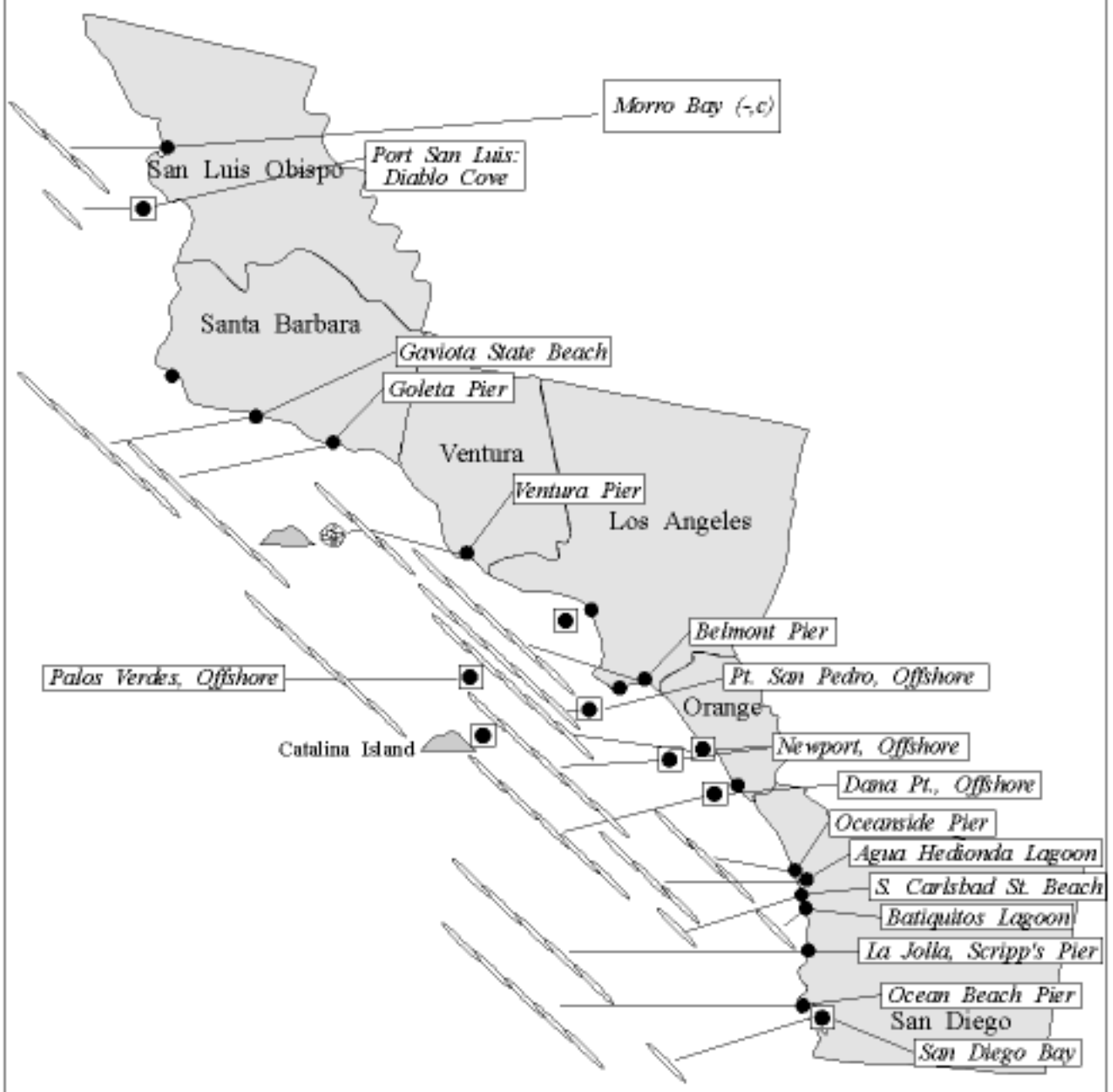
Phytoplankton Monthly Report

May 1999

Technical Report No. 99-13

Distribution of Toxin Producing Phytoplankton

Southern California



Relative Abundance of Known Toxin Producers

Alexandrium Species

- Rare (less than 1%)
- Present (between 1% and 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

Pseudo-nitzschia Species

- Present (less than 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows: (a,p) = Abundance for Alexandrium and Pseudo-nitzschia. e.g., (c,p) = common, present; (a,-) = abundant, not observed

Southern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). Low numbers of *Alexandrium* were observed in a sample collected from the Ventura Pier on May 15.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). The high relative abundances of *Pseudo-nitzschia* observed in March and April along the coast of San Diego, Orange, and Los Angeles counties decreased at most sites by the end of April and into the first week of May. However, high densities of this diatom persisted along the San Diego coast through April and May. By the second week in May cell numbers increased again along the coast of Orange and Los Angeles counties. By the third week the bloom was also observed along the Santa Barbara coast.

The state's Food and Drug Laboratory reported that domoic acid was not found in any of the mussel samples analyzed.

The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.

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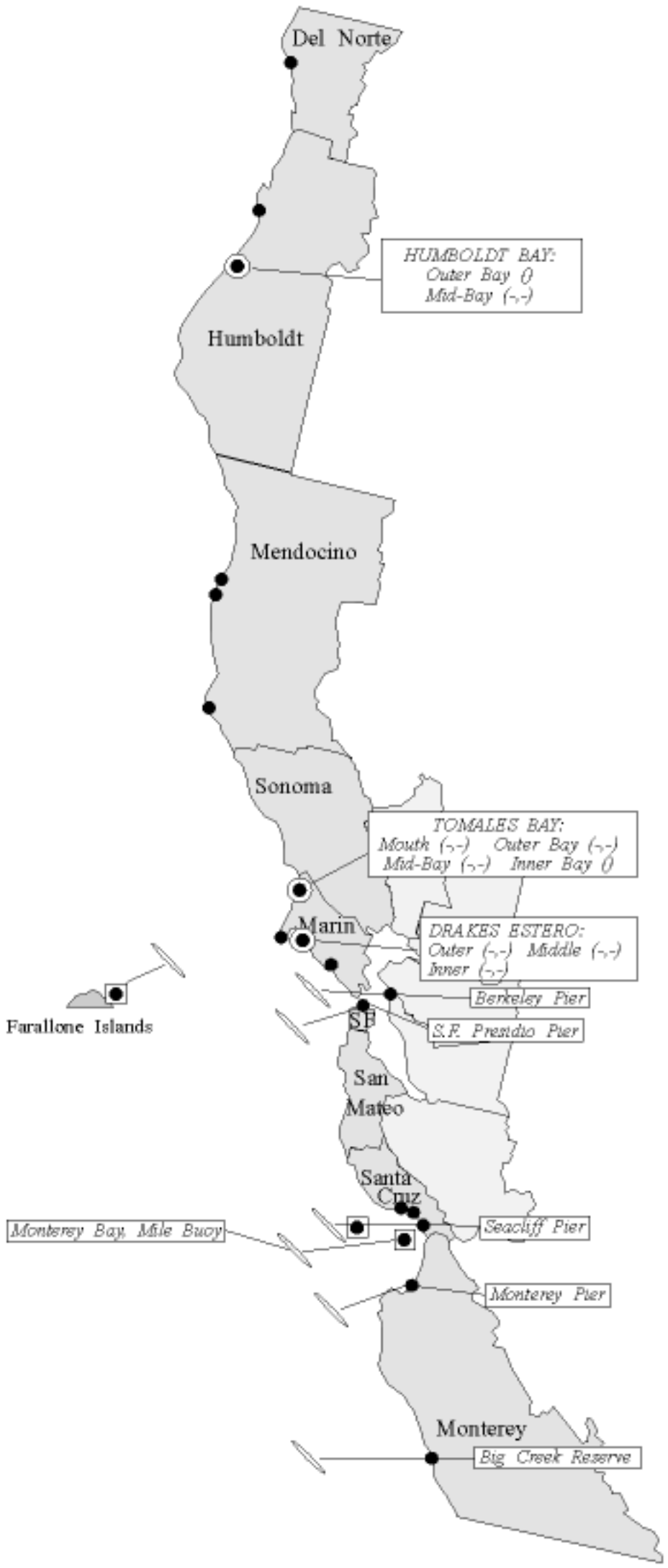
Distribution of Toxin Producing Phytoplankton

Northern California



Northern California Summary:

Alexandrium catenella (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* was absent from all Northern California sites during May.

Pseudo-nitzschia species (includes all known potential domoic acid producing diatoms). *Pseudo-nitzschia* was observed at several locations along the coast during May.

Low numbers of this diatom were observed offshore near the Farallone Islands (May 31), inside the Golden Gate (May 31), and farther inside San Francisco Bay (May 14). The relative abundance and cell numbers of *Pseudo-nitzschia* were low for all of these observations.

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